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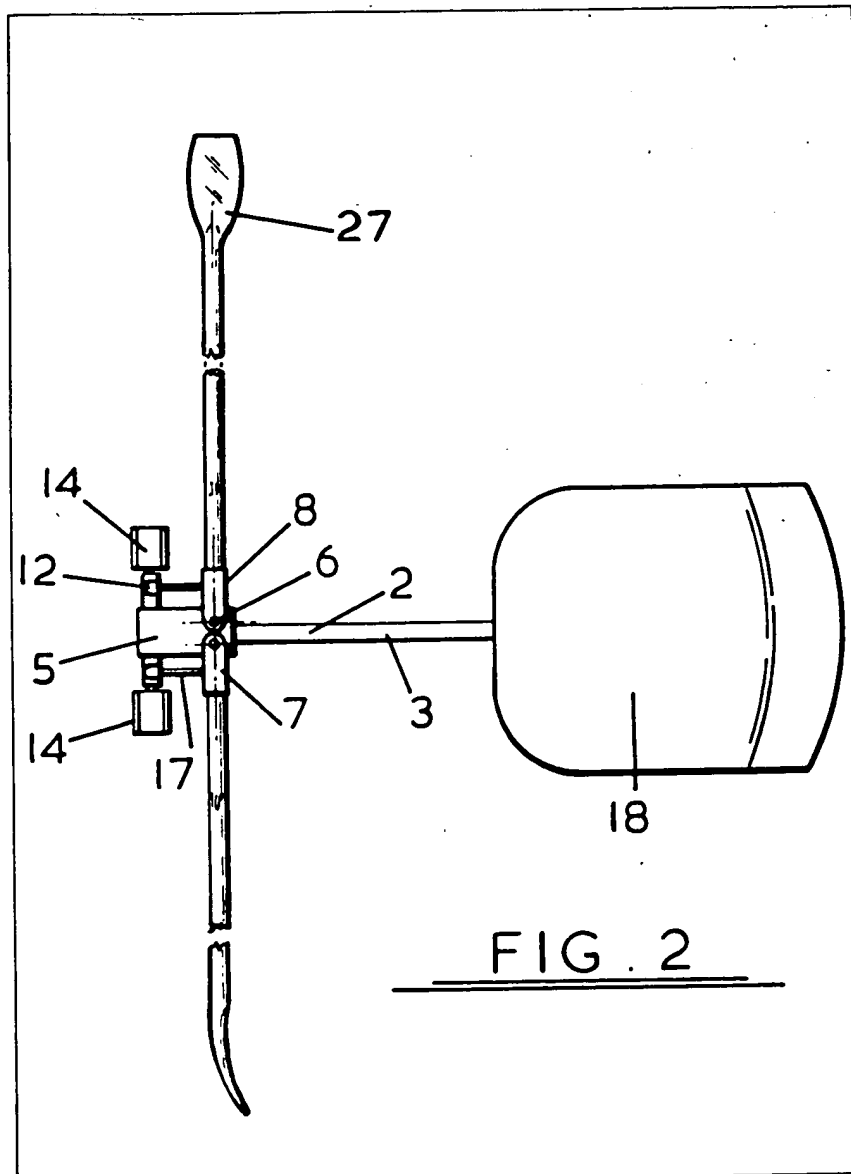
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## (54) Oar mounting system

(57) A bow facing rowing arrangement  
comprises a support 2-5 having at least  
one first pivot 6 to which is coupled a  
respective oar 20 or oar support 7 and a  
sliding foot rest 14 which is drivingly

connected to the oar 20 or oar support 7  
via a linkage 12, 17 so that an additional  
driving force from the oarsman's legs is  
applied to the oar during the power  
stroke. The pivot 6 is disposed inboard  
of the point where the oar is grasped.  
Drive transmissions other than the link-  
age 12, 17 are suggested eg gear  
wheels pulley or chain transmissions  
and hydraulic or pneumatic mechan-  
isms. In an alternative arrangement the  
foot rest 14 is fixed and seat 18 reciprocates.



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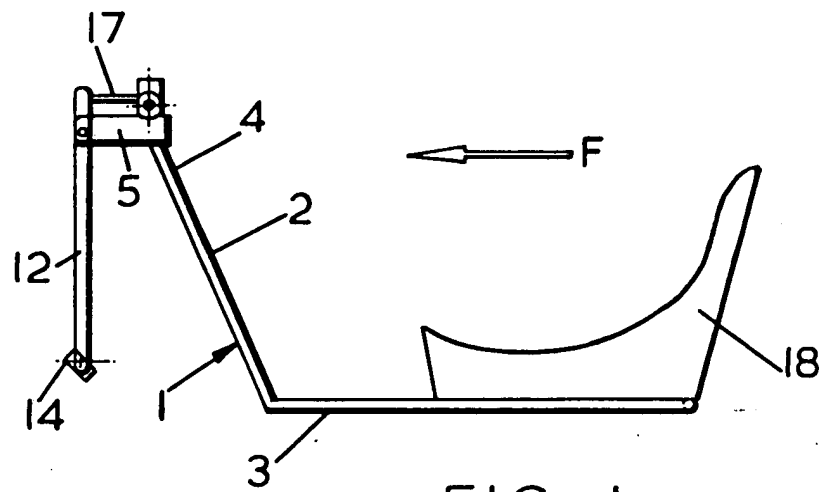


FIG. 1

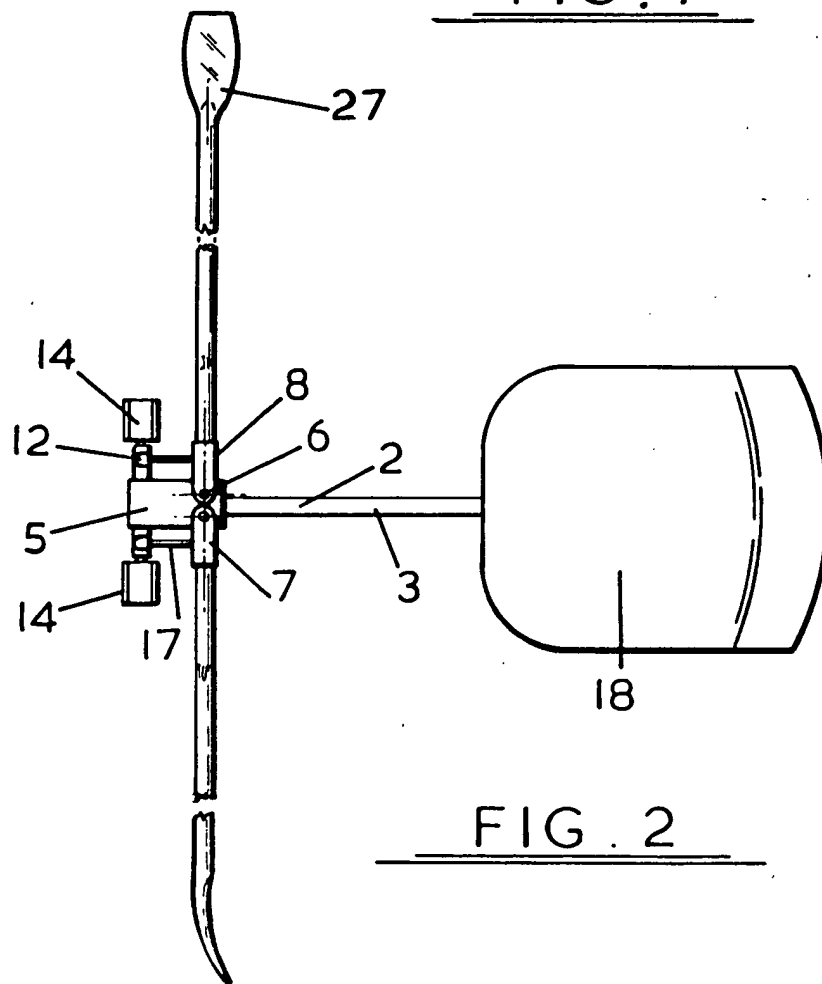
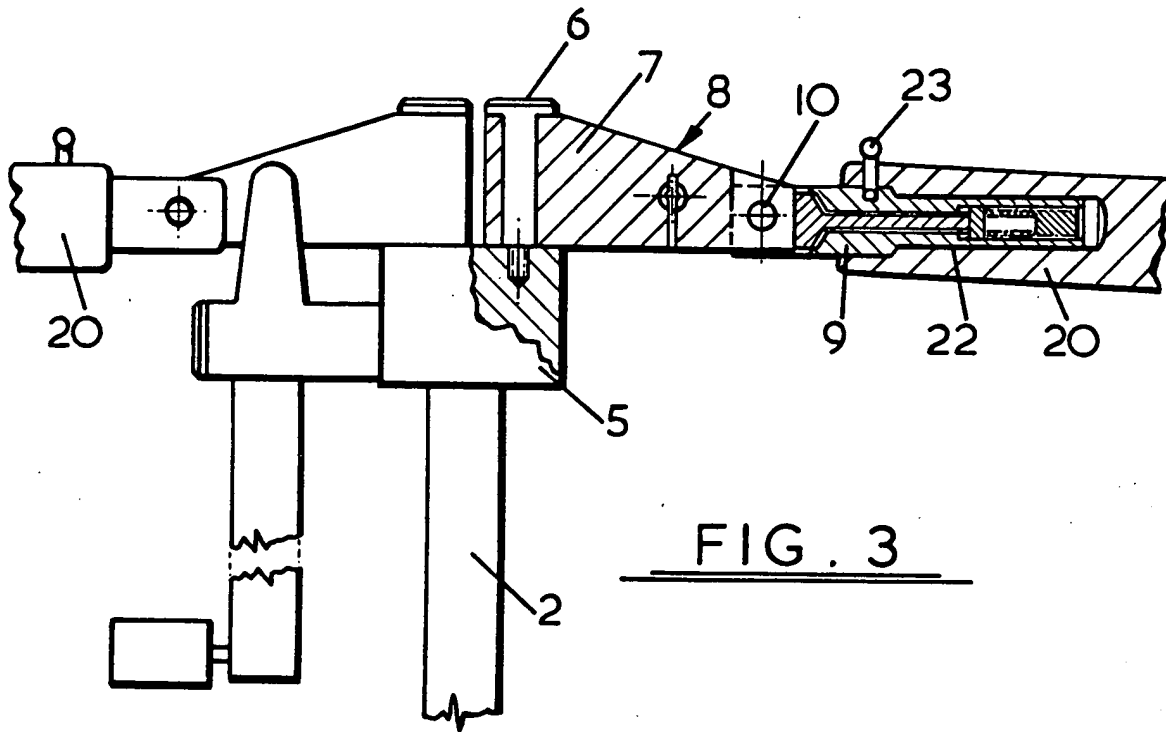


FIG. 2



**FIG. 3**

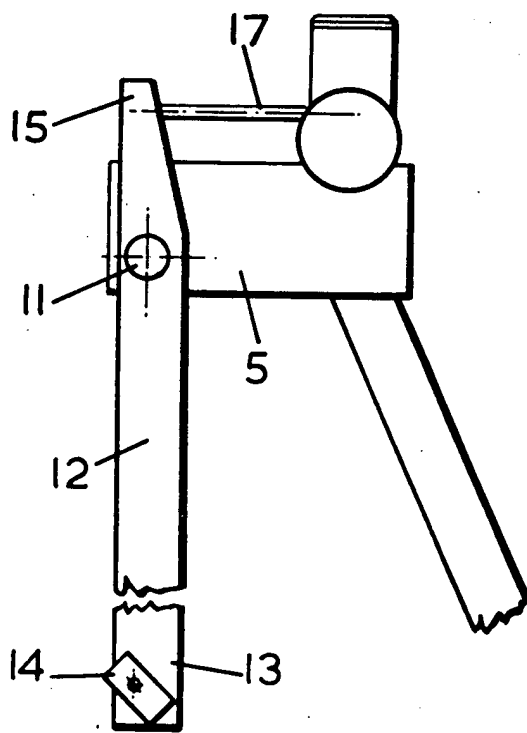


FIG. 4

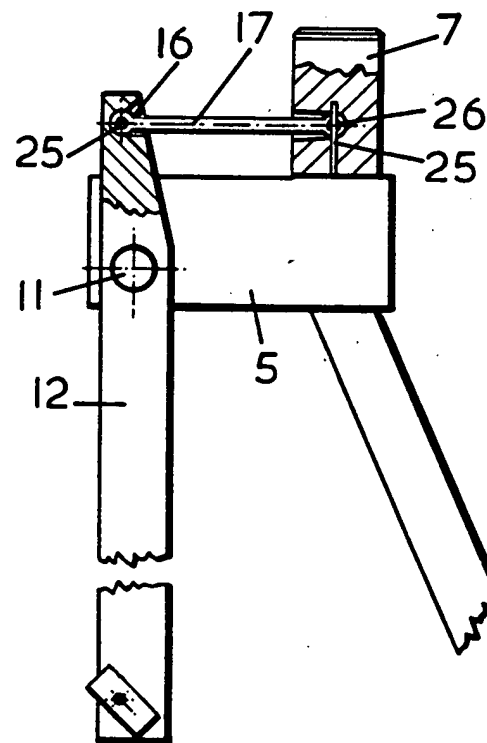


FIG. 5



## SPECIFICATION

### Oar mounting system

5 This invention relates to rowing or paddle boats and in particular to a system of mounting oars in a boat. Conventionally oars are pivotally mounted in rowlocks at the outermost sides of a boat or on struts substantially outboard of the boat. Thus when an

10 oarsman pulls on the inboard ends of the oars, the oars pivot about the rowlocks so that the blades at the outboard ends move in the opposite direction (to that of the pull) to drive the boat through the water. This means that the oarsman is obliged to face in a direction opposite to that in which the boat is propelled.

In more advanced rowing boats, e.g. sculls, the propulsive force is increased by the use of a sliding seat to make use of the leg muscles in addition to the arms and upper body muscles. In this system though the additional propulsive force all has to be transmitted through the arms placing additional strain thereon. Furthermore, the movement of the mass of the oarsman, which in practice is quite substantial relative to that of the boat, in the boat results in a rather jerky movement with the boat being continually accelerated and decelerated as the oarsman moves backwards and forwards.

Another disadvantage of conventional systems is the relatively long oar length required due to the need for a substantial length of oar inboard of the pivot point thereof. Apart from an increased weight penalty, there is also the need for a relatively large waterway width to accommodate the boat and oars during rowing.

It is an object of the present invention to avoid or minimise one or more of the above disadvantages and to provide a new oar mounting system.

The present invention provides an oar mounting device for use in a rowing or paddle boat which device comprises: a support means having at least one first pivotal connection means for pivotal connection of a respective oar or oar support to said support means at or in proximity to an inboard end of said oar, and foot engagement means connectable to said oar or oar support via a drive transmission means, said support means and foot engagement means being formed and arranged to be disposable in a said boat in relation to a seating position for a rower such that said foot engagement means and seating position are reciprocally displaceable relative to each other upon bending of a rower's legs during rowing and said first pivotal connection of said oar or oar support is disposable, in use, relative to a said seating means so as to be engageable by said rower, for rowing of the boat, between said first pivotal connection means and the oar blade.

For the avoidance of doubt it should be understood that the present invention is applicable to various forms of boat including for example sculls and canoes which are propelled by various form of oars including paddles etc., and the terms boat and oar as used herein are intended to be construed accordingly.

Naturally the invention also extends to a boat provided with one or more oar mounting devices of the invention.

Desirably said support member is mounted in a fixed relation to a seat for the rower, being rigidly connected to or formed integrally with a seat or seat mounting, and the foot engagement means being reciprocally displaceable relative thereto.

With an oar mounting system of the present invention the fulcrum or pivotal mounting of the or each oar is transferred to a position inboard of the oarsman's grip so that the blade moves in the direction of pull and the oarsman is able to face the direction of travel. By utilising the oarsman's leg power and transmitting the driving force thereof substantially directly to the oars (i.e. not through the oarsman's body) it is possible to obtain an improved propulsive force and efficiency whilst maintaining a relatively comfortable rowing action.

Further preferred features and advantages of the invention will appear from the following description given by way of example of some preferred embodiments illustrated with reference to the accompanying drawings in which:

90 *Figure 1* is a side elevation of a first oar mounting device of the invention;

*Figure 2* is a plan view of the device of *Figure 1*;

*Figure 3* is a partially sectioned detail front elevation of the central part of the device of *Figure 1*;

95 *Figure 4* is a side elevation;

*Figure 5* is a partially sectioned side elevation;

*Figure 6* is a view corresponding generally to *Figure 3* of a second embodiment; and

100 *Figure 7* is a partially sectioned side elevation of the embodiment of *Figure 6*.

*Figure 1* shows an oar mounting device 1 having a support member 2 which comprises a base member 3, a forwardly extending upwardly inclined member 4 connected to said base member 3, and a pivot support member 5 at the upper end of said inclined member 4.

The pivot support member 5 has two laterally spaced apart symmetrically disposed first pivotal connection means comprising vertically extending pivot pins 6 each of which connects the inboard end of a first part 7 of oar support means 8 to the support member 2, 5. A second part 9 of the oar support means 8 is connected to said first part 7 by a generally horizontally extending pivot pin 10.

115 At the forward end of the pivot support member 5 on either side thereof are pivotally connected thereto by a forward horizontal pivot pin 11, two drive members 12. The forward ends 13 of said drive members 12 are provided respectively, left and right, foot engagement means in the form of pedals 14 - similar in construction and mounting to bicycle pedals. The upper ends 15 of the drive member 12 are each connected pivotally 16 to one end of a link member 17 whose other end is connected pivotally to the first part of the oar support means 8 intermediate the pivotal connections 6, 10 of said first part 7. The drive members 12 and link members 17 together constitute a drive transmission means of the mechanical linkage type. It will be appreciated though that many other forms of drive transmission could also

elongated pivot support member 5 are used. Also the pivotal connection between the oar support 8 (which may if desired be formed integrally with the oar) and the link member 17 of the fifth pivotal connection (between the oar support 8 and drive member 12) has the following form. A shaft 31 is rotatably mounted inside the oar support 8 to extend from the ball 32 of the ball and socket joint 30 along an axis above and/or aft of the centre of pressure line of the oar blade through an enlarged diameter portion 33 of the oar support 8, which portion has a recess 34 with an angular extent of the order of 90° generally at right angles to the shaft 31. At said recess 34 the shaft 31 has a slot 35 in which is received a torque 36 at the end of the link member 17, the latter being retained therein by a pin 37 extending through the shaft 31 and slot 35. This arrangement, as described above and shown in the drawings, permits feathering of the oar by rotation of the oar through 90° whilst retaining driven engagement with the link member 17 and thence the drive member 12 with an automatic casting action of the general type already referred to hereinabove.

Although the device of the invention is particularly useful for use in rowing it can in fact also be embodied (without any oars if appropriate) in other devices for extracting a high level of driving force from the human body i.e. using both arm and leg muscles. Such devices could include exercise machines, dynamos or devices mounted in any suitable land, sea or air vehicle for propulsion thereof including e.g. cycles and man-powered flying machines.

### 35 CLAIMS

1. An oar mounting device for use in a rowing or paddle boat which device comprises: a support means having at least one first pivotal connection means for pivotal connection of a respective oar or oar support to said support means at or in proximity to an inboard end of said oar, and foot engagement means connectable to said oar or oar support via a drive transmission means, said support means and foot engagement means being formed and arranged to be disposable in a said boat in relation to a seating position for a rower such that said foot engagement means and seating position are reciprocally displaceable relative to each other upon bending of a rower's legs during rowing and said first pivotal connection of said oar or oar support is disposable in use, relative to a said seating means so as to be manually engageable by said rower, for rowing of the boat, between said first pivotal connection means and the oar blade.

2. A device as claimed in claim 1 wherein the support means is in the form of a substantially rigid support member.

3. A device as claimed in claim 1 wherein said support member has a base portion for securing, in use, to the hull of a said boat and an upwardly extending support portion having two first pivotal connection means substantially adjacent each other on an upper portion thereof.

4. A device as claimed in claim 2 or claim 3

wherein each said first pivotal connection means has a generally vertical pivotal axis.

5. A device as claimed in claim 4 wherein the oars are connected to said support member via an articulated oar support means.

6. A device as claimed in claim 5 wherein each said oar support means includes a second pivotal connection means having a generally horizontal pivoting axis.

7. A device as claimed in claim 6 wherein said oar support means includes a third pivotal connection means formed and arranged for pivotal connection of the oar to said oar support means for rotation of the oar through a limited angle about an axis extending generally longitudinally of said oar.

8. A device as claimed in any one of claims 2 to 7 wherein the drive transmission means comprises at least one substantially rigid drive member having a lower portion provided with foot engagement means and an upper portion pivotally connected to the support member via a fourth pivotal connection means having a generally horizontal pivoting axis, said upper portion having a fifth pivotal connection means for connection thereof to said oar or oar support means.

9. A device as claimed in claim 8 wherein said fifth pivotal connection means is in the form of an elongate link member connected at respective ends to said drive member and the oar support means via ball-and-socket connections.

10. A device as claimed in claim 8 or claim 7 wherein two drive members are provided for driven engagement, in use, by respective feet of a rower.

11. A device as claimed in any one of claim 2 to 10 wherein said support member is rigidly connected to a seat.

12. A device as claimed in any one of claim 1 to 11 when mounted in a boat.

13. A device as claimed in any one of claims 1 to 12 when connected to at least one oar.

14. An oar mounting device substantially as described hereinbefore with particular reference to the accompanying drawings.